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INCH-POUND

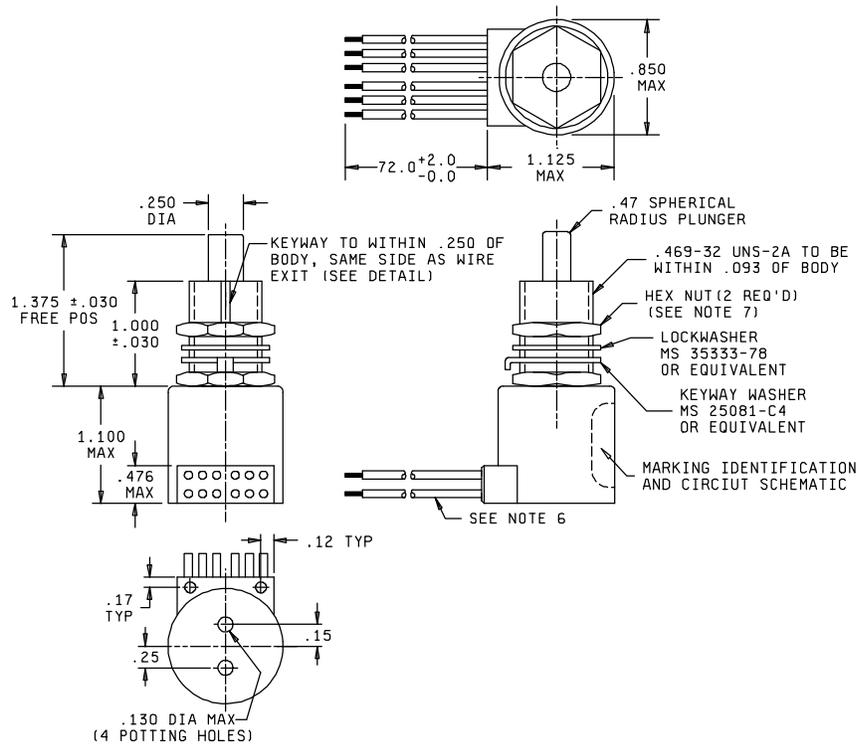
 MIL-PRF-8805/104B
 3 September 1999
 SUPERSEDING
 MIL-S-8805/104A
 8 April 1976

PERFORMANCE SPECIFICATION SHEET

SWITCHS, SENSITIVE, PLUNGER, 7 AMPERES,
 4PDT, RESILIENT SEAL, GROUNDED PLUNGER

This specification is approved for use by all Departments
 and Agencies of the Department of Defense.

The requirements for acquiring the product described herein
 shall consist of this specification and MIL-PRF-8805



M8805/104-001
 PIN PLUNGER

FIGURE 1. Dimensions and configurations.

MIL-PRF-8805/104B

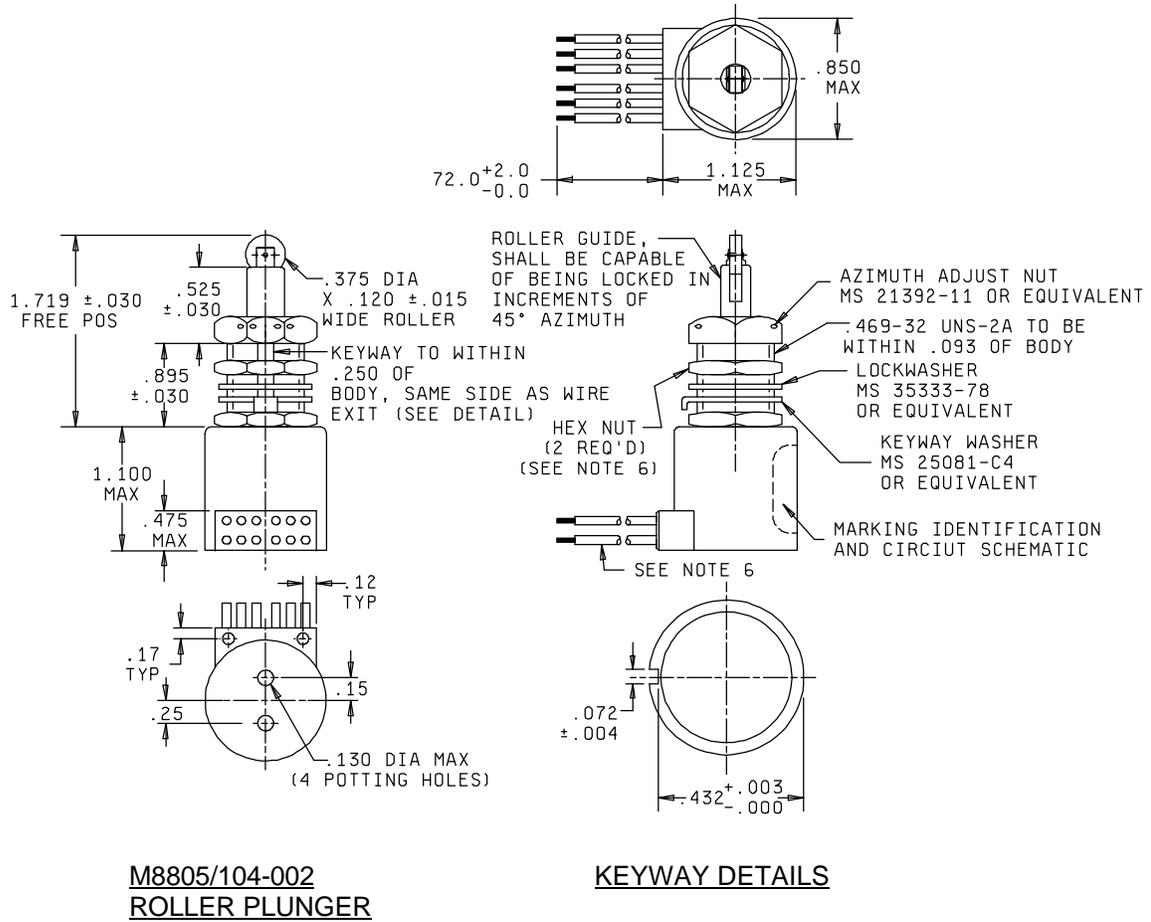
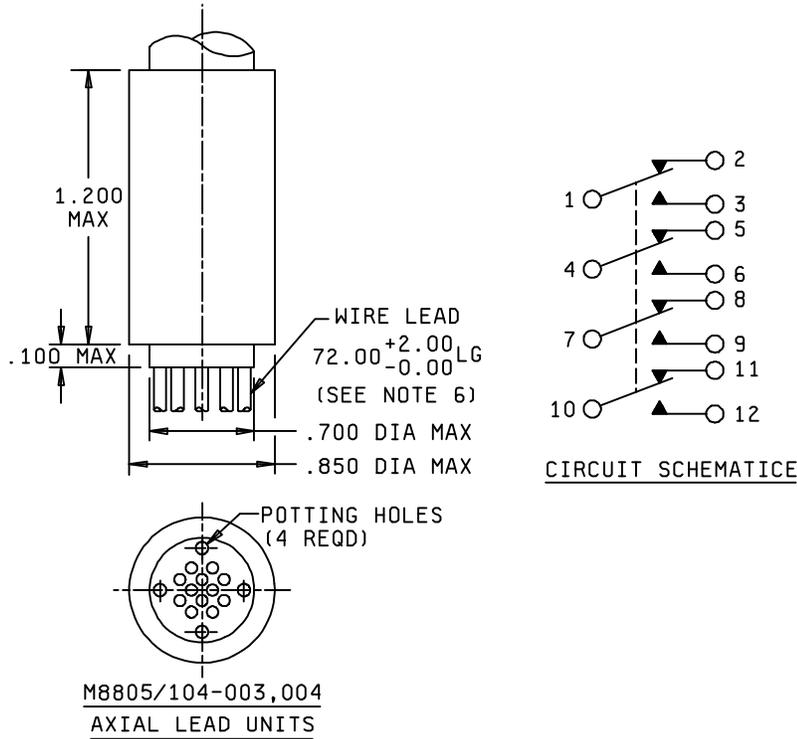


FIGURE 1 Dimensions and configurations - Continued.

MIL-PRF-8805/104B



Inches	mm	Inches	mm	Inches	mm	Inches	mm
.003	0.08	.12	3.05	.469	11.91	1.000	25.40
.004	0.10	.130	3.30	.47	11.94	1.100	27.94
.015	0.38	.15	3.81	.475	12.07	1.125	28.58
.030	0.76	.17	4.32	.525	13.34	1.200	30.48
.072	1.83	.250	6.35	.700	17.78	1.375	34.93
.093	2.36	.375	9.53	.850	21.59	1.719	43.66
.100	2.54	.432	10.97	.895	22.73	2.0	50.80
						72.0	1828.80

NOTES:

1. Dimensions are in inches.
2. Unless otherwise specified, tolerances are ± 0.03 (0.76 mm) for two place decimals, ± 0.010 (.25 mm) for three place decimals, and $1/2^\circ$ for angles.
3. Metric equivalents are given for general information only.
4. Contour optional provided maximum dimensions specified are not exceeded.
5. The marking (identification and circuit schematic) shall be permanently and legibly marked on the switch case in the location shown (on side of case opposite keyway).
6. Wire leads shall be marked at 3.0 inch intervals with switch circuit identification number followed by wire gage number (1-20, 2-20, 3-20, etc.).
7. Hex nut shall be MS21340-04 or equivalent. Alternative base metals and protective finishes, as approved by the qualifying activity, may be utilized for hardware material.

FIGURE 1 Dimensions and configurations - Continued.

MIL-PRF-8805/104B

REQUIREMENTS:

Dimensions and configuration: See figure 1.

Enclosure design: 4 (Resilient).

Temperature characteristic: 1 (-55° to +85°C) continuous duty plus switches shall be subjected to 100 cycles of temperature variations. One cycle is defined as the temperature and times, in order shown, in table I. Immediately upon completion of testing of a temperature requirement, the switches shall be inserted into the subsequent test chamber. At the end of the temperature condition of each cycle, the switches shall make, carry, and break rated resistive current at rated voltage (seal level) for the number of operations shown in table I. Test shall begin after oven temperature stabilizes. Prior to each make/carry/break operation involving rated resistive current the switch shall carry without making or breaking 400 percent of rated resistive current for 200 milliseconds. Failures, defined as the inability to make or break rated resistive current, shall not occur throughout these tests.

TABLE I. Temperature cycling.

Temperature	Time	Number of switch operations
(°C)	(Minutes)	
110	30	30
174	10	10
215	1	2

Shock type: Method 213, test condition B (75G), MIL-STD-202.

Vibration grade: 2 (10 Hz to 2,000 Hz).

Weight: M8805/104-001,-003: .75 pound max.

M8805/104-002,-004: .80 pound max.

Operating characteristics (± 20 percent variation from specified values acceptable after test):

Actuating force:	9 \pm 3 pounds.
Full overtravel force:	30 pounds maximum.
Releasing force:	5 pounds minimum.
Pretravel:	.050 inch maximum.
Movement differential:	.030 inch maximum
Overtravel:	.125 inch minimum.
Coincidence of operating and releasing points:	All circuits shall transfer within .010 inch of plunger travel after first circuit transfers.

Strength of actuating means: 100 pounds minimum.

MIL-PRF-8805/104B

Contact resistance: Low level circuit requirements apply.

Dielectric withstanding voltage:

Sea level: 1,250 V rms.

Altitude: 600 V rms at 80,000 feet.

After electrical endurance, the dielectric withstanding voltage points of application between all unconnected terminals of the same pole is not applicable.

Seal test: Only watertight test shall be performed in group A.

Mechanical endurance: 25,000 cycles.

Electrical endurance: 25,000 cycles.

Low level circuit: 25,000 cycles over the continuous duty temperature range (applies provided switch has not made nor broken more than 250 milliamperes at 6 volts dc or peak ac).

Electrical ratings: See table II.

Moisture resistance: When switches are tested wet, the insulation resistance shall not be less than 100 meg-ohms.

Icing: Applicable.

Case and plunger grounding for EMI: All case parts shall be bonded together (such as by staking, soldering, welding, or brazing) either along the entire abutting surfaces or at a minimum of four approximately equally spaced areas along each abutting surface. The electrical resistance between the plunger and the wire exit portion of the switch housing bracket most remote from the threaded bushing shall not exceed 800 milliohms under all the following conditions:

- a. Measurements made in accordance with MIL-STD-202, method 311.
- b. Without polishing or cleaning the areas on the switch to which the test leads are attached.
- c. With the plunger both fully extended and fully depressed.
- d. Throughout the total life of the switch.

MIL-PRF-8805/104B

Wire exit: Wire lead-potting junction shall be protected from damage resulting from lead-dress strains. Compliance with this requirement shall be proved as follows:

Three leads shall be tested.

No lead shall be tested in more than one direction.

Forces shall be applied in three mutually perpendicular directions, including the one most likely to cause failure.

Qualification testing (destructive): A force of 20 pounds shall be applied for a period of 24 hours minimum after which there shall be no break through the insulation at the strain relief. The force shall be increased in three pound increments for a duration of five minutes minimum for each increment. The wire insulation shall be examined for break through at the strain relief after each five minute exposure at the increased load. The test shall be conducted with loads increased up to 42 pounds or until wire breakage. Permanent deformation of strain relief components shall not occur at loads less than 24 pounds. Wire elongation shall not be considered as cause for failure. Wire breakage shall not occur at loads less than 20 pounds. There shall be no detrimental effect on the potting which results in seal failure, or failure to meet the dielectric withstanding voltage requirements.

Group C (non-destructive): A 15 pound load shall be applied for one minute. There shall be no permanent deformation of the strain relief members or break through of the wire insulation, or wire breakage. There shall be no detrimental effect on the potting which would result in failure to meet the seal and dielectric withstanding voltage requirements.

Marking: Marking shall remain legible after the following test:

- a. Soak for a minimum of 72 hours at room temperature in each of the fluids specified below.
- b. After each soak period the specimen shall be wiped dry and then rubbed with a dry thumb a minimum of 20 times applying moderate pressure. Note: Each test specimen shall be subjected to soak periods in all the fluids.
- c. If metal foil identification plates are used, they shall comply with MIL-P-19834. In addition to the legibility requirement defined herein, the identification plate shall not become loosened or partially or completely detached from the switch housing during or after the soak tests.
- d. The test fluids to be used shall include:
 - MIL-J-5161, Jet Fuel, Referee.
 - MIL-H-5606, Hydraulic Fluid, Petroleum Base, Aircraft, Missile, and Ordnance.
 - MIL-L-7808, Lubricating Oil, Aircraft Turbine engine, Synthetic Base.

Part numbers: M8805/104 - (dash number from table IV).

MIL-PRF-8805/104B

TABLE I. Electrical ratings.

Load	28 V dc		115 Vac, 400 Hz	
	Sea level (amperes)	80,000 ft. (amperes)	Sea level (amperes)	80,000 ft. (amperes)
Resistive	7	7	1	1
Inductive	3	3	1	1
Motor	4	4	1	1
Lamp	2	2	1	1

Qualification and group C retention of qualification:

Group submission: See table III.

Group C retention of qualification: Nondestructive wire exit test is applicable (6 sample units).

TABLE III. Qualification and group - C tests (group submission).

Examination or test	Samples	Extent of approval
Qualification inspection table of MIL-PRF-8805 <u>1/</u>	M8805/104-002 (12 units)	All
Visual and mechanical examination Operating characteristics	M8805/104-001, -004 (2 units each)	
Wire exit test <u>2/</u>	M8805/104-001, -004 (2 units each with potting, 2 units each without potting)	
Temperature cycling <u>3/</u> (in accordance with table I)	M8805/104-001 (2 units)	
Marking test <u>4/</u>	M8805/104-001 (2 units)	

1/ Case and plunger grounding test to be accomplished before and after mechanical endurance.

2/ Destructive test is applicable in initial qualification testing only.

3/ Applicable in qualification testing only.

4/ Following immersion, the switch shall also be subjected to terminal strength, insulation resistance, dielectric withstanding voltage, operating characteristics, and seal tests.

MIL-PRF-8805/104B

TABLE IV. Dash numbers.

Dash number	Actuator	Wire exit
-001 -002	Pin plunger Roller plunger	Side
-003 -004	Pin plunger Roller plunger	Bottom

Custodians:
Air Force - 11
DLA - CC

Preparing activity:
DLA - CC

(Project 5930-1691-031)